2024

S2 EP3: A Guide to the Local Group

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Astrophysics: Deep In The Space With Maanvinder Pilania

A Guide to the Local Group

Hello and this is Maanvinder and I'm back with another episode. Today I I will tell you about a fascinating group of galaxies, our galaxy is part of. But before I move forward, I want you to imagine no of galaxies in our universe. 1, 2 or 5 million or 1 billion or 200 billion. If your answer is more than 200 billion, then you are correct. There are between 200-300 billion galaxies in our observable universe. And these galaxies are not just scattered through the universe, in fact they are part of a large group of galaxies due to their mutual gravity, just like the star clusters I told you about in the previous episode but in this case its on a large scale, we are talking millions of light years and they are galaxies and not individual stars in a galaxy. Such kind of group of galaxy is "Local Group". Local Group is dumb-ball shaped like group of galaxies. Our own Milky Way galaxy is part of this group. When I said dumb-ball, I meant it looks like that with Andromeda, our neighbor galaxy at one lobe and Milky Way at the other. The Local Group was first recognized by the American astronomer Edwin Hubble.
The Local Group has around 80 galaxies and most of them are either dwarf galaxies or satellite galaxies. The three largest members of the Local Group are: Andromeda or M31; the biggest, Milky Way; the second- biggest and Trapezium Galaxy; third biggest. The two biggest galaxies in the group are spiral galaxies and accounts for most of the mass in the group. Each of these two galaxies has their own system of satellite galaxies which revolves around them. Another interesting thing about these two galaxies is that they are on a collision course with each other and in about 5 billion years they will completely merge into each other forming a new galaxy and who knows maybe will be called as 'milkomeda'. Local Group has roughly a diameter of 10 million light years and is part of a very large cluster of galaxy groups called Virgo Supercluster which is located 70 million light years from the centre of Local Group. There's still debate over the centre of Local Group but it is believed to lie between Andromeda and Milky Way.

The current computer models has predicted the future of Local Group to be a large single elliptical galaxy. Tens of billions of years into the future all galaxies in the system will merge into each other. After Andromeda and Milky Way will merge into each other along with their satellite galaxies, then the third biggest member of this system, the Trapezium galaxy will merge into the newly formed "milkomeda". And this merger will continue until all the galaxies merge into each other. As you know the universe is expanding so all the galaxies are moving away from ours except those who are part of the Local Group, so in the future there will be just one galaxy as all the other galaxies will pass the horizon and we will never be able to see them, what will be left is that large single elliptical galaxy. So its time to know about some galaxies other than the big three I told you about.

So at number one we have Magellanic Clouds. These are two satellite galaxies of the Milky Way. Large Magellanic and Small Magellanic Cloud are their names. What is

more interesting about these two that there is a bridge called “Magellanic Bridge” between them which is a stream of hydrogen connecting these two galaxies where stars from SMC are being pulled towards LMC. SMC is located some 197,000 light years while LMC is located approximately 163,000 light-years from the Earth and is on the collision course with the Milky way. It will merge in about 2.5 billion years.

So this was from me for this episode. I hope you love it and let me know about it in the comments, polls or review section of the platform you are listening this podcast on.

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